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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/543,480	04/06/2000	Venugopal Srinivasan	28049/36241	7414

27160 7590 04/23/2003

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EXAMINER	
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ART UNIT	**PAPER NUMBER**
2614	6

DATE MAILED: 04/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/543,480	SRINIVASAN, VENUGOPAL	
	Examiner	Art Unit	
	Nathan A Sloan	2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 April 2000* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *2,3, 5* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed April 13, 2001 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. Specifically, the DE 4316297 reference has not been considered because no English translation or explanation has been provided. It has been placed in the application file, but the information referred to therein has not been considered.

2. The Information Disclosure Statement filed April 13, 2001 contained reference Dougherty (5,629,729), which was filed missing columns 7 and 8. Examiner has included a complete copy of Dougherty (5,629,729) and considered the reference in its entirety.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-2, 4-7, 27-30, and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Fardeau et al. (5,574,962).

With respect to claims 1, 5, 7, and 32, Fardeau teaches a system and method for adding an inaudible code to an audio signal. The claimed sampler for generating "a plurality of short blocks of sampled audio" wherein the short blocks have a "duration less than a minimum audibly perceivable signal delay" is met by data processing means 14 of Figure 1, which as taught in column 6, lines 11-16 performs frequency range separation using a Fourier Transform. As taught in column 6, lines 21-25 one or more of the frequency bands are used to form a frequency component that encodes an identification message. These components are taught to have a "predetermined minimum duration," in column 6, lines 46-55 in order to make the encoded message inaudible. The claimed "frequency transformation arranged to transform the long block into a frequency domain signal comprising a plurality of independently modulatable frequency indices, wherein a frequency difference between two adjacent ones of the indices is determined by the minimum duration and the sampling rate," is performed by transform 16 of Figure 1 using a Fourier Transform. The claimed selector to select a neighborhood of frequency indices is met by selector 18, which selects a frequency component or "a neighborhood of frequency indices" with the lowest index and highest index being within a predetermined value is taught in columns 6, lines 34-40. Upon selection of an appropriate range or "neighborhood," an encoder 20 is used to "modulate two or more of the indices in the neighborhood" in order to add an inaudible code

from generator 22 to the signal, where the code is made inaudible by having a predetermined duration. As taught in column 7, lines 29-35, notches B and C have an energy that is reduced to substantially zero meeting the claimed "extremum," and the code is modulated while still keeping the overall energy constant as taught in column 2, lines 39-40.

With respect to claim 2, Fardeau teaches in column 6, lines 5-10 that the apparatus is comprises a microprocessor with working memories meeting the claimed "digital computer having a buffer memory."

With respect to claim 4, the claimed increasing energy of a selected index and decreasing energy of a short associated block is taught in column 3, lines 17-22.

With respect to claim 6, the claimed composite signal comprising "a television broadcast signal and wherein the another portion of the composite signal comprises a video signal" is taught by Fardeau with the teaching in column 6, lines 1-4 of a television signal for a program, which inherently comprises video.

With respect to claim 27, the claimed broadcast measurement system in which an inaudible code is added to an audio signal and read within a statistically sampled dwelling unit is taught in column 1, lines 60-67 and column 2, lines 6-18. The claimed encoder and corresponding encoding methods are met by data processing means 14 of Figure 1 as noted in response to claim 1 above. The claimed receiver to acquire the encoded audio signal and decoder to read the code from the audio signal with a buffer memory to store "one of the short blocks" and "arrange to store a long block" is taught in column 7, lines 56-67 and column 8, lines 1-6 with data processing means 42 splitting up frequencies of the signal, selecting frequency components that include the encoded message, and detecting components that

correspond to the code. This process is best understood with reference to Figure 3, which also shows memory 52 for storing coded data.

Claim 28 is met as noted above in response to claim 6.

With respect to claim 29, the claimed "encoder comprising a frequency transformation arranged to transform the long block into a frequency domain signal" is taught in column 3, lines 23-30 with the use of a Fourier transform to split up a sound signal into frequency components, alter the energy of the components, and rebuild the sound signal for broadcast or recording.

With respect to claim 30, the claimed "receiver comprising a microphone" is taught in column 4, lines 21-30.

5. Claims 8-14, 23-25, 33 are rejected under 35 U.S.C. 102(e) as being anticipated by Jensen et al. (6,421,445).

Jensen et al. (6,421,445) teach a system and method for including codes in audio signals.

With respect to claims 8, 12, and 33, the claimed apparatus for reading a code from an audio signal with a predetermined number of samples is met by DSP 266 of Figure 11. As taught in column 25, lines 36-48 the audio signal is separated into component ranges or bins using FFT processing. As seen in Figure 12B, data is gathered into memory 270 at step 454 until a sufficient number of audio samples have been stored for carrying out the FFT, taught in column 26, lines 60-63. A predetermined number of data points are used to form a predetermined number of frequency bins each having a predetermined width, as claimed, taught in column 25, lines 39-47. The claimed "frequency transformation arranged to transform the one block into spectral data spanning a predetermined number of frequency bands, wherein each of

the frequency bands comprises a neighborhood of frequency indices" is met by the FFT as noted above. The claimed processor and vote determiner to determine "for each of the neighborhoods, if a respective predetermined one of the frequency indices is modulated" and to detect a "synchronization block if, in a majority of the frequency bands, the respective modulated frequency index is a respective index selected for inclusion in the synchronization block," are met by DSP 266 and code determination logic circuit 320 which analyze frequency bands and determine if a majority if a synchronization symbol is present as taught in column 27, lines 8-22. If a synchronization block is detected, DSP 266 determines if following frequency indices are modulated and if a majority of the indices are provided as inclusion in a data block, taught in column 29, lines 22-50 and column 31, lines 6-13. A comparison value is used to compare the encoded audio signal to determine the presence of a transmitted code element.

With respect to claims 9-11, the claimed frequency transformation being a FFT is met by Jensen as noted above, the claimed execution by a digital computer and the claimed processor operating under program control, which inherently contain algorithms including the above described vote determiner means, are taught in column 4, lines 40-57.

With respect to claim 13, the claimed reading a value k as the code bit if the k^{th} index is modulated is taught by reading modulated frequency indices, noted above, with a corresponding value of energy B(j) taught in column 25, lines 45-47.

With respect to claim 14, the claimed index pattern comprising a "pseudo-random sequence" is not explicitly taught by Jensen. However, it is the position of the examiner that this limitation is inherent. Jensen teaches comparing a code to the modulated indices as seen by the

compare function 277 of Figure 13. The index patterns are "pseudo-random" in that they are a varying signal within a range that carry code signals.

With respect to claim 23, the claimed audience measurement system reading an inaudible code in a statistically sampled dwelling is seen in Figures 16 and 17. The claimed "encoder arranged to add a predetermined code bit to each of a predetermined number of odd frequency bands within a bandwidth of the audio signal" is met by encoder 348 of Figure 16, which performs operation of adding an inaudible code according to the flowchart seen in Figures 7A through 7E. The claimed "receiver within a dwelling arranged to received the encoded audio portion" is met by a digital computer which is arranged with a decoder "to acquire a respective test value of the code bit from each of the frequency bands, to compare the test values, to determine that one of the test values is the code bit only if that test value is acquired from a majority of the frequency bands, and to otherwise determine that no code bit has been read" as taught in column 5, lines 10-34, column 29, lines 22-50, and column 31, lines 6-13 and noted above in response to claim 8.

With respect to claim 24, the claimed audio signal being part of a television broadcast signal is taught in column 33, lines 32-35.

With respect to claim 25, the claimed receiver including a microphone is met by microphone 386 of Figure 17.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 3 and 15-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fardeau (5,574,962) in view of Jensen et al. (6,421,445).

With respect to claim 3, Fardeau teaches the use of a Fourier Transform but not a Fast Fourier Transform. Jensen teaches the use of FFT in column 14, lines 41-46. It would have been obvious for one skilled in the art at the time of the invention to modify the methods of Fardeau by utilizing a FFT as taught by Jensen in order to provide a faster frequency transformation.

With respect to claims 15 and 19, the claimed sampling apparatus, processor, frequency transformation, and encoder are met as noted above in response to claim 1. Furthermore, the claimed "signal analyzer arranged to determine if the tone-like audio portion has a tone-like character within any one of the predetermined number of neighborhoods; and, encoder suspender arranged to suspend encoding of the encoder within any neighborhood in which the tone-like audio portion has a tone-like character" is not explicitly taught by Fardeau. Fardeau does teach data processing means 14 in column 7, lines 6-15 that analyzes energy in frequency bands to determine if energy is above a minimum value so as to avoid adding the code to the sound signal during a period of silence. If a period of silence is detected, encoding is stopped. Fardeau,

however, does not teach suspending encoding based on the detection of a "tone-like character." Jensen teaches in column 7, lines 54-61 performing tonal analysis based on a variety of values to determine if a section of a signal is suitable for masking a code. If the section is not determined to be suitable, coding is not performed in this region. It would have been obvious for one skilled in the art at the time of the invention to modify the encoding suspension methods of Fardeau by performing tonal analysis in order to ensure transmitted codes are not interfered with by certain tones and ensure that the coded word is inaudible to viewers.

With respect to claim 16, the claimed composite signal comprising "a television broadcast signal" is taught by Fardeau in column 6, lines 1-4 .

With respect to claims 17 and 21, Fardeau teaches the use of a Fourier Transform but not a Fast Fourier Transform. Jensen teaches the use of FFT in column 14, lines 41-46. It would have been obvious for one skilled in the art at the time of the invention to modify the methods of Fardeau by utilizing a FFT as taught by Jensen in order to provide a faster frequency transformation.

With respect to claims 18 and 22, Fardeau does not teach carrying out a masking algorithm as described in ISO/IEC 13818-7. Examiner takes Official Notice that ISO/IEC 13818-7 is a well known standard. It would have been obvious for one skilled in the art at the time of the invention to modify the methods of Fardeau by analyzing signals according to ISO/IEC 13818-7 in order to conform to well known standards.

With respect to claim 20, the claimed composite signal comprising "a television broadcast signal and wherein the another portion of the composite signal comprises a video

signal" is taught by Fardeau with the teaching in column 6, lines 1-4 of a television signal for a program, which inherently comprises video.

8. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jensen et al. (6,421,445).

Jensen does not teach the claimed receiver comprising "an audio output jack." Examiner takes Official Notice that it is well know to include audio output jacks in receivers. It would have been obvious for one skilled in the art at the time of the invention to modify the methods of Jensen by including an audio output jack in order to allow audio output of the received signal.

9. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fardeau et al. (5,574,962).

Fardeau does not teach the claimed receiver comprising "an audio output jack." Examiner takes Official Notice that it is well know to include audio output jacks in receivers. It would have been obvious for one skilled in the art at the time of the invention to modify the methods of Fardeau by including an audio output jack in order to allow audio output of the received signal.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Thomas (5,768,680) teach a system used to monitor an audio signal and identify embedded signals.

Sherwood (6,512,796) teach a system and method for encoding data into an audio signal utilizing synchronization information.

Bourcet et al. (6,151,578) teach a system for including imperceptible data into an audio signal using a start block and frequency modulation.

Bird et al. (5,355,161) teach an identification system for broadcast program segments using encoded data.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan A Sloan whose telephone number is (703)305-8143. The examiner can normally be reached on Monday-Friday from 7:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Miller, can be reached on (703) 305-4795. The fax phone number for the organization where this application or proceeding is assigned is (703)308-5399.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-4700.

JOHN MILLER
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